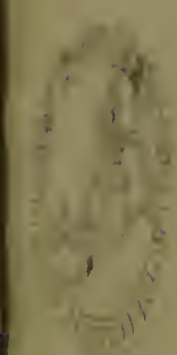
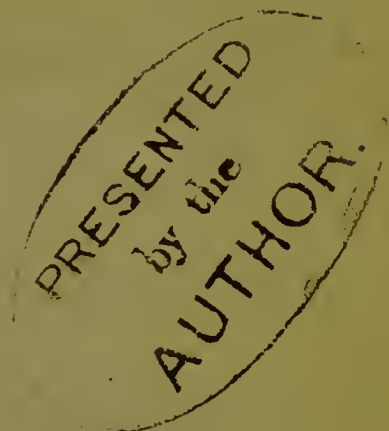


Royal letter
from



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Royal College of Surgeons
from the Author.



HANBURY
ON
STORAX.





ON STORAX.

BY DANIEL HANBURY.

"Verum ad accuratam ac diligentem Materiæ Medicæ tractationem instituendam, remediî ejusque historiam et virtutes à medicis recensitas exponere non sufficit; sed etiam multa insuper considerata sunt ac perpendenda."—GEOFFROY, *Tract. de Mat. Med.*

WRITERS on *Materia Medica*, ancient as well as modern, have generally concurred in applying the name *Storax* or *Styrax* to two distinct substances namely *Liquid* and *Solid Storax*. I might almost say to two groups of substances, since each comprehends two or more varieties.*

The plant to which *Storax*, at least the solid kind, is commonly referred, is *Styrax officinale* Linn., a small tree of the Nat. Ord. *Styracæ*, occurring in Provence, Italy and the Levant. It is this tree, to which all authors admit, the account of *Storax* given by Dioscorides in the first century, refers.† In fact, it is not unreasonable to suppose that a tree so nearly allied to that producing Benzoin, should be capable of affording an analogous product.

That it may under certain favourable circumstances exude a fragrant resin, even in France and Italy, we know from the positive testimony of two authors, the first of whom, Duhamel, has written in these words:

"J'ai trouvé en Provence, près de la Chartreuse de Montrieu, sur de gros Aliboufiers, des écoulements assez considérables d'un baume très-odorant. Il n'est pas douteux, ce me semble, que ces Aliboufiers ne fournissent du *Storax*."‡

The second author is the Abbé Mazeas who, in a communication under date 18 Jan. 1769 addressed to the *Journal des Sçavans*,§ states that on a plain in the neighbourhood of Tivoli, near Rome, sheltered on the N. and N.E. by a chain of mountains contiguous to Monte Genarro, Rocca Giovane, S. Polo &c. which form a semi-circle open to the south,—in fact, in a very warm situation, the *Styrax* shrub yields by incisions in its bark, the valued exudation known as *Styrax en larmes*.

As the account of *Storax* left us by Dioscorides, who was a native of Cilicia, one of the countries affording the drug, is important, I will here give its

* A conventional distinction of confining the name *Storax* to the solid drug and *Styrax* to the liquid, is adopted by some modern authors. But as such a use of terms leads to some inconsistency, I have not adopted it, but employ the word *Storax* as the English equivalent of the original Greek word *Στύραξ*.

† Perhaps I ought to except Professor Orphanides of Athens, who has hinted that the text of Dioscorides on the subject of *Storax*, requires correction. *Bulletin de la Société Botanique de France*. T. iij. p. 147.

‡ *Traité des Arbres*. Paris, 1755. 4to. T. ij. p. 289. Montrieu or Montrieux is a little place about 10 miles to the north of Toulon, in the department of the Var. In this neighbourhood, the *Styrax* grows wild.

In order to endeavour to obtain an authentic specimen of the exudation of *Styrax officinale*, I wrote to my friend Dr. Planchon of Montpellier, who at my suggestion kindly caused incisions to be made during the hottest part of last summer, in the trunk and branches of a large and fine *Styrax* growing in the Botanic Garden there. The experiment was quite unsuccessful: neither aqueous sap nor resinous juice flowed from the incisions.

§ Vol. for 1769, p. 105.

literal translation, subjoining in a note the Latin text of Sprengel,* the latest commentator upon that author.

Storax is the exudation of a certain tree resembling a quince-tree. It is preferred yellow and shining, resinous, having whitish lumps, retaining for a long period a very grateful odour; when softened, it emits a certain honey-like humidity. Such is the Gabalite, the Pisidian and the Cilician [Storax]. That of bad quality is black, friable and branny. There is also found an exudation resembling guni, transparent, myrrh-like; but this is produced rarely. Storax is adulterated with the powder of the tree itself, made by the erosion of little worms, honey and the dregs of iris† and some other things, being added. There are those who pound with storax in very hot weather, either wax or tallow imbued with aromatics, and press it through a strainer having wide openings, into cold water, forming as it were, little worms: they sell this, which they call *vermiform Storax*. Inexperienced persons admit it as genuine, not regarding its remarkably powerful odour: for that which is not fraudulent, is somewhat strong.

The particulars given by Pliny in his chapter on Storax, are very minute and explicit, although his supposition that the drug packed in reeds was a natural production and his notion of it being attacked by insects, must be regarded as erroneous.

The following is Pliny's account ‡:

"That part of Syria joining up to Judæa, and lying above Phœnicia, produces *Storax*, which is found in the vicinity of Gabala and Marathus, as also of Casius, a mountain of Seleucia. The tree bears the same name and has a strong resemblance to the quince. The tree has a harsh taste, with a pleasant smell; in the interior it has all the appearance of a reed, and is filled with a liquid juice. About the rising of the Dog-Star, certain small winged worms hover about this substance and eat it away, for which reason it is often found in a rotten state, with worm-holes full of dust. The Storax next in estimation after that already mentioned, comes from Pisidia, Sidon, Cyprus and Cilicia; that of Crete being considered the very worst of all. That which comes from Mount Amanus, in Syria, is highly esteemed for medicinal purposes, and even more so by the perfumers. From whatever country it comes, that which is of a red colour is preferred, and it should be both unctuous as well as viscous to the touch; the worst kind is that which crumbles like bran, and is covered all over with a whitish mould. This substance is adulterated with the resin of cedar or with gum, and sometimes with honey or bitter almonds; all which sophistications may, however, be detected by the taste. The price of Storax of the best quality is seventeen denarii per pound.§ It comes also from Pamphylia, but this last is more arid and not so full of juice." ||

* "Styrax laerima est arboris cuiusdam eydoniæ similis. Præfertur flavus ac pinguis, resinosus, grumos habens albicantes, quam diutissime in odoris gratia permanens, quique dum mollitur, melleam quamdam humiditatem ex se remittit. Talis est gabalites, pisidius ac eilieus. Deterior niger, friabilis ac furfurosus. Invenitur et laerima gummi similis, transparent, myrrhæ æmula; verum hæc raro nascitur. Adulterant autem arboris ipsius scobe, vermieulorum erosione facta, admisto melle et iridis erassamento aliisque nonnullis. Non desunt, qui et eæram aut sebum aromatis imbutum ad solem acerrimum eum styraeæ subigant et per colum latis foraminibus pervium in aquam frigidam, quasi vermieulos effingentes, exprimant et venundant, quem styraeæm ideo vermieulatam appellant. Imperiti eum tanquam sincerum admittunt, non attenti ad odoris insignem vehementiam. Est enim admodum acris, qui fraudis expers est. * * * " Pedanii Dioscoridis Anazarbei *de Mat. Med. Libri V.*, ed. Curt. Sprengel. Lips. 1829, 30. T. I. p. 82 (lib. 1. cap. LXXIX.).

† Possibly some residue obtained in making the preparation called *Irini spissamentum* described lib. 1. cap. LXVI.

‡ Pliny's *Natural History*, Bostock and Riley's translation: Book xij. Chap. 55.

§ According to the table given by Bostock and Riley, which fixes the *denarius* at 8½d. sterling and the *pound* at 1½ oz. Av. + 60.45 grains, the rate of 17 *denarii* per *pound* is equivalent to 16s. per lb. Avoirdupois. It is proper however, to state, that some MSS. read 8 *denarii*, others 19. The reading, 17 *denarii*, is that adopted by Sillig in the Hamburg and Gotha edition of 1851-5; vide Vol. II. p. 363.

|| "More arid and not so full of juice," (*sed aridior minusque succosus*). Sillig reads *aridior*, in preference to *acrior* which is found in some MSS., and Bostock and Riley follow him.

The localities here mentioned, include those cited by Dioscorides: and most of them can be identified. Gabala is the modern village of Djebcleh, a few miles to the south of Latakia. The ruins of Marathus still exist. Casius and Amanus are mountains near the Gulf of Iskenderun, still to be traced under Turkish names. The position of the ancient countries of Pisidia, Pamphylia and Cilicia in the south-eastern part of Asia Minor is well known; and Sidon, Cyprus and Crete are familiar to all. In several of these localities, *Styrax officinale* is, at the present day, a common wild shrub.

The drug thus described by these ancient authors, is that which I conceive to be the original and legitimate Storax, namely a fragrant resin in separate, or more or less agglutinated tears, somewhat resembling Benzoin, exuded either spontaneously or after incision, from the trunk of the *Styrax officinale* of Linnæus. That such a drug in a state of greater or less purity, was in former, and even in comparatively recent times, an article of commerce, appears certain from the specimens still existing in a few old collections of *Materia Medica*, as well as from the descriptions of the best Storax given by the pharmacologists of the last century agreeing very fairly with the account left by Dioscorides.*

This fine kind of Storax, always extremely scarce, was called *amygdaloid* from the small, white, almond-like tears of which it partially consisted. It also bore the name *Styrax calamites*, a term derived from the ancient method of packing it in reeds (*calami*).† It has however, wholly disappeared from commerce, its name alone *Styrax calamites* or *calamita* being retained in favour of that odoriferous, sawdust-like compound which we are accustomed to find in the shops. In France, it is applied to a black, extractiform, odoriferous substance which I shall more particularly describe in a future paper.

Although we possess no modern account of the collection of solid Storax, confirmatory of that given by Dioscorides, other than those I have quoted (which do not, however, relate to collecting the drug for the purposes of commerce), there exist two remarkable statements of the method of collecting *Liquid Storax*, which it will not be unprofitable to examine with some attention. I ought however, first to state that it is questionable whether the Greeks were acquainted with *Liquid Storax*: Arab writers on the other hand, distinctly mention it, though their accounts are far from satisfactory and clear.‡

The first of these two statements is that of James Petiver, an apothecary of London, who was noted as the possessor of a considerable collection of objects of natural history.

In the year 1708, that is ten years before his death, Petiver presented to the Royal Society of London a communication which, *verbatim et literatim*, is as follows:

“The Manner of making *Styrax liquida*, alias *Rosa Mallas*.

Communicated by Mr. James Petiver, F.R.S.

Rosa Mallas grows upon the Island *Cobross*, at the upper end of the *Red Sea* near *Cadess*, which is 3 days Journey from *Suez*: It is the Bark off a Tree (taken off every Year, and grows again) boiled in Salt Water till it comes to a Consistence like Bird-lime, then separated and put into a Cask and brought to *Judda*, and so to *Mocha* in *June* and *July*, where it sells from 60 to 120 Dollars per Barrel, according to its Goodness: the best is what is freest from Clay and

* See especially Kirsten, *Exercitatio de Styrace*, Altorf, 1736. 4to.

† According to Matthioli, the allusion to *Calami* in connexion with Storax first occurs in Galen. I find the passage to be as follows:

“Manifestum insuper est Styracem qui in calamis à Pamphiliâ apportatur, Andromachum præcipere. Paucissimus autem illic styrax nascitur: tantumque ab hoc vulgari distat, quantum à vino quod in tabernis venditur Falernum.” (Galen. *De Antidotis*, lib. i. cap. 14.)

The term *Calamites* has been supposed to be derived from *καταβαλίτης*, a vulgar reading for *γαβαλίτης*, as explained at length by Matthioli (*Comm. in lib. I. Dioscorid.* cap. LXVIII.)

‡ Avicennæ *Liber Canonis*, lib. II. tract. 2. cap. 431. 600. 623. (ed. Venet. 1564.)

Dirt, which is commonly mixed with it; and the way to try it is by washing it in Salt Water which will cleanse it: The *Arabs* and *Turks* call it *Cotter Mija*.

N.B. *A Barrel is 4201.*" *

A statement so precise and circumstantial was received with more or less credit, and we find it quoted by Geoffroy,† Hill,‡ Alston,§ Mérat and De Lens,|| Martiny,¶ Guibourt,** Pereira,†† Royle,‡‡ &c.

Hill, indeed, quaintly remarks, "it is a little unlucky that nobody has given us any description of this *Rosa Mallas*."—But is *this* the only ambiguity? Let us first ask,—*Does there exist any island of Cobross at the upper end of the Red Sea?*

Thanks to the excellent chart of the Red Sea made from the surveys of Messrs. Moersby and Carless in 1830–33, and to the minute *Sailing Directions for the Red Sea*, both published by the Hon. East India Company, we have a mass of very exact and positive information relating to its coasts, and to its islands from the largest, down to the very rocks and shoals. Now Petiver makes his island of *Cobross* to be "*near Cadess, which is 3 days journey from Suez.*" To what distance we ought to consider this to be equivalent, I know not; but it is evident from the chart already referred to, that there is no island in the Red Sea nearer to Suez than about 160 miles. Neither this island, nor any other in the Red Sea, bears the name of *Cobross*, or any other name which can be supposed to represent it,—that is, so far as my researches have gone, and I have taken much pains in investigating the subject.

Again,—are there any islands in the Red Sea extensively wooded, as Petiver's account would lead us to suppose? On this point, the minute information in the *Sailing Directions*, is entirely of a negative character.

Distrusting my own judgment in such a question, I applied to John Walker, Esq., Geographer to the Hon. East India Company, and to the Rev. Charles Forster, author of the *Historical Geography of Arabia*, gentlemen whose acquaintance with sources of information on such matters, might, I thought, suggest some explanation of Petiver's statement: but neither of them has been able to throw any light upon it.

Although I am unable to find a *Cobross* in the Red Sea, I must state that D'Herbelot in his *Bibliothèque Orientale* gives *Cobros*, as a synonym of *Cyprus*: and also, that Pliny mentions an island of *Coboris* or *Covoris*, which has been identified as one of the Sohar Isles, near Burka, a town situated on the East coast of Arabia, near the entrance to the Persian Gulf.§§ The position of either of these islands is, of course, perfectly irreconcilable with that of Petiver's *Cobross*.

It is somewhat surprising that of the many authors that have quoted Petiver's account of *Liquid Storax*, none appears to have been struck with the fact that the drug is not said to be conveyed from "*Cobross*" to Europe, but that it is "*brought to Judda and so to Mocha*,"—that is to say, it is carried to a spot some 1300 miles south of Suez.

So much for the fallacies in Petiver's account of "*The manner of making Styra^x Liquida*." In a future part of this notice, I will endeavour to show what traces of truth it contains.

The next statement on which I propose to offer some remarks, is that of

* *Philosophical Transactions*, 1708–1709. Vol. xxvi. p. 44.

† *Tract. de Mat. Med.* (1741), T. II. p. 493.

‡ *History of the Materia Medica* (1751), p. 713.

§ *Lectures on the Materia Medica* (1770), Vol. II. p. 418.

¶ *Dictionnaire de Matière Médicale*, T. IV. (1832), p. 128.

‡ *Encyklop. d. med.-pharm. Nat. u. Rohwaarenk.* Bd. I. (1843) p. 94.

** *Histoire des Dragues Simples*. T. II. (1849), p. 294.

†† *Elem. of Mat. Med.* Vol. II. (1850) p. 1216.

‡‡ *Manual of Mat. Med.* (1853) p. 639.

§§ Forster's *Historical Geography of Arabia*, Lond. 1844. Vol. ij. p. 230.

Dr. X. Landerer of Athens, as contained in a communication published in Buchner's *Repertorium* for 1839.*

This communication, I translate thus :

The Storax plant, *Styrax officinalis* is found in various parts of continental Greece, as well as in some of the islands of the Archipelago. There however, it forms but a small shrub and does not possess the agreeable odour ascribed to it by botanists. The bark of the plant occurring in Greece, has not the slightest odour, which probably is due to neglect in cultivation. On the contrary, such is not the case with the plant as found in the Turkish islands of Rhodes and Cos, and especially with it as cultivated by the people of Cos. (a)

As I obtained some time since in Syra from a merchant coming from Rhodes some information on the subject, I will make it public, not doubting that, though but little, it will be acceptable.

The Storax plant is called in Cos and Rhodes *βουχούρι* (*buchûri*). At its flowering season, it fills the air with the most agreeable vanilla-like perfume. At the period for the collection of the bark and younger twigs, which are employed for the preparation of *Buchuri-jag*, i. e. *Styrax-oil* (oil being called in Turkish, *jag*), permission is obtained from the Pasha residing at Rhodes, a small sum being paid for it. Those who are provided with the permission to collect, now make with small knives longitudinal incisions and peel off from the stem the fresh pieces of bark in the form of little narrow ribbons. Owing to their adhesive juice they easily stick together [*backen sie leicht zusammen*]; from them are formed masses of one *oke* weight (= 2lbs.), which are reserved for the preparation of *jag*, or are immediately purchased by Rhodian merchants and sent to Rhodes.

The preparation of *Buchuri-jag* is effected by merely pressing the before-mentioned masses in presses somewhat warmed, called *Styrakia*, and not by boiling. The *jag* obtained by gentle pressure is of an unctuous consistence, a light grey colour, and diffuses a very agreeable vanilla-like odour. This is the only sort that is exported; but in Cos and Rhodes, it is also used in the preparation of a very odoriferous mass made by the addition of finely-powdered Olibanum and formed into cakes of the size of a fist, which are called *Styrakia*. The preparation of these masses belongs exclusively to the conventual clergy, who distinguish their manufacture with the convent seal.

By repeated warming and stronger pressure, an almost black *Buchuri-jag* is obtained, which is used by the inhabitants themselves for the most healing ointments and medicines.

The bark remaining after the expression of the *jag* is bound together and conveyed partly to Constantinople and partly to Syra and there used for fumigation.

With regard to the decoction of the bark and the adulteration of *Styrax*-balsam with turpentine, the Rhodian merchant assured me that they would not know how to go about it; and that the adulteration with turpentine, might, in case of detection, involve even the punishment of death.

[Note a.] The Storax trees appear at that place to be of important value, and are given to the young women as dowry, in the same manner as in Greece, the bride is presented with so many Olive-trees.

That Dr. Landerer has been greatly deceived by his informant will, I think, be very evident from the subjoined testimonies :

1. Niven Ker Esq., who was for several years British Consul at Rhodes, informed me that he was quite ignorant of the carrying on in that island of the manufacture described by Dr. Landerer.

2. Sidney H. Maltass Esq. of Smyrna in a letter to me under date 7 October, 1853, speaking of *Liquid Storax*, says "Cos and Rhodes produce none."

3. Lieutenant Robert Campbell R.N., H.B.M. Consul at Rhodes, writes from Rhodes under date 16 December, 1855, that Mr. Landerer in attributing to the

* *Einige Worte über die Gewinnung des Storax liquidus* vom Prof. und Leibapotheker X. Landerer in Athen, *Buchner's Rep für d. Pharm.* Bd. 18. s. 359-362.

islands Cos and Rhodes the production of Storax, has committed an egregious error, as they have never produced it.

Moreover, the evidence of Mr. Maltass proves, as I shall shortly show, that *Styrax officinale* is not the tree yielding *Liquid Storax*.

There are other exceptional points in Dr. Landerer's account, which I will for the present pass over, remarking only that the statement that liability to the punishment of death is incurred in the case of a person being detected adulterating Storax with turpentine, is characterized by Lieut. Campbell as "a mere invention."

Previous to detailing the information which I have collected as to the method of preparing *Liquid Storax*, it will be well briefly to review the various opinions which have been held as to its origin.

1. Many of the older writers on *Materia Medica* consider it an artificial compound; Dale in particular, asserts, that what was found in the London shops in his time (1693) was altogether factitious.*

2. Those writers who adopt Dr. Landerer's statement, regard *Liquid Storax* as the produce of *Styrax officinale* Linn.

3. By many authors, *Liquid Storax* is referred to *Liquidambar styraciflua* Linn., a tree found in the southern part of the United States, in Mexico, and in other parts of Central America.

However capable that tree may be of producing an analogous resin, it is well ascertained that the *Liquid Storax* used in England, is all imported from the Levant; and there are sufficient reasons to conclude that such is also the case with that used on the continent and that it is certainly not the produce of America. I therefore dismiss the supposition that the *Liquid Storax* of commerce is of transatlantic origin.

4. By some authors, *Liquid Storax* has been conjectured to be the produce of *Liquidambar altingiana* Blume.

This tree is a native of the islands of the Indian Archipelago and of Burmah, where the inhabitants occasionally extract from it an odoriferous semi-fluid resin; but the product is not abundant, nor does it resemble the *Liquid Storax* of commerce; there is not moreover, the slightest evidence of it reaching Europe in any quantity.

It is however, a curious fact that the name by which this tree is at the present day known to the Malays, is *Rasamāla*, a word very close to Petiver's *Rosa Mallas*. To this I shall revert in a future page.

5. *Liquidambar orientale* Miller, is regarded by Guibourt, Lindley, the authors of the French *Codex*, and some others, as the source of *Liquid Storax*, an opinion which I shall be able to show to be correct.

[From the PHARMACEUTICAL JOURNAL AND TRANSACTIONS for MARCH, 1857.]

HAVING in a former number brought under review the various opinions current as to the origin of *Liquid Storax*, and stated the points on which I consider them erroneous, I will now proceed to communicate the information which I have myself received regarding the drug from three valued correspondents in the Levant, namely, Sidney H. Maltass Esq. of Smyrna, Lieut. Robert Campbell, R.N., H.B.M. Consul in the Island of Rhodes, and Dr. James McCraith of Smyrna.

* "Verum quod in officinis nostris pro Styrace liquido venditur omnino factitia res est, ut certior factus sum à pharmacopolis variis Londinensibus."—*Pharmacologia*, Lond. 1693, p. 427.

The information is still not quite perfect, but in all essential particulars, I believe the following is a correct account of the

PREPARATION OF LIQUID STORAX.

BOTANICAL ORIGIN.—The tree from which Liquid Storax is obtained, is *Liquidambar orientale* Miller (*L. imberbe* Aiton), as is proved by specimens of the leaves and fruits procured at my request by Mr. Maltass (see wood-cut).

LOCALITIES.—South-west of Asia Minor.—Forests in the district of Sighala near Melasso; forests near Moughla, and near Giova and Ullà in the Gulf of Giova; also near Marmorizza and Isgengak opposite Rhodes.

Mr. Maltass passed through a dense forest of *Liquidambar* between the village of Caponisi and the town of Moughla on the 7th or 8th of May, 1851: he describes it as consisting of trees resembling the plane, but evidently of a different species, the leaf being smaller, and each tree far denser in foliage than the plane usually is. "I also observed" says he "that most of the larger trees had the [outer] bark stripped off from the trunk and the inner bark scraped off. I gathered some of the fruit and leaves, and proceeded on my journey towards Moughla, my road lying for upwards of an hour through this beautiful forest. I observed that the trees were from twenty to thirty feet in height, but whenever there was a break in the forest and the trees had sufficient air and space, they were of larger growth, many of them being forty feet high, more especially in the immediate vicinity of streams of water. My guide assured me that in some places in the forest in the direction of Melasso, he had seen some of these trees sixty feet in height. He could not tell me the name of the tree, but stated that an oil was produced from it called *Buchur*, and that the trees were mutilated to obtain it."

EXTRACTION OF THE LIQUID STORAX.—In June and July, the outer bark is stripped off on one side of the tree and (according to Lieut. Campbell) made into bundles and reserved for the purpose of fumigation. The inner bark is then scraped off with a semi-circular or sickle-shaped knife and thrown into pits until a sufficient quantity has been collected. Mr. Maltass states that it is then packed into strong horse-hair bags and subjected to pressure in a wooden lever press. Upon removal from the press, hot water is thrown over the bags and they are pressed a second time, after which the greater portion of the resin will have been extracted.

Lieut. Campbell's account is a little different: he says the inner bark is boiled in water over a brisk fire, upon which the resinous part comes to the surface and is skimmed off. The boiled bark is next put into hair sacks and pressed, boiling water being added to assist in the extraction of the resin, or, as it is termed, *yagh* (i. e. oil).

Dr. McCraith says that the Storax collectors, who are chiefly a tribe of wandering Turcomans called *Yuruks*, are armed with a triangular iron scraper with which they scrape off, together with the juice of the tree, a certain quantity of bark, which they collect in leathern pouches suspended to their belts. When a sufficient quantity has been obtained, it is boiled in a large copper and the separated liquid resin is run into barrels. The residual bark is placed in hair-cloth and pressed in a rude press, the extracted resin being added to the general mass.

The product obtained by the processes here described, is the grey, opaque, semi-fluid resin, well known as *Liquid Storax*.

The bark from which the *Liquid Storax* has been extracted, is emptied out of the bags and exposed in the sun to dry, after which it is shipped to the Greek and Turkish islands and to many towns in Turkey, where it is much esteemed for the purpose of fumigation, although since the disappearance of the plague, its employment has greatly diminished.

This is the substance known to pharmacologists as *Cortex Thymiamatis* or *Storax Bark*, as is proved by abundant specimens sent me by Mr. Maltass.



LIQUIDAMBAR ORIENTALE, MILL.

From a specimen obtained by S. H. Maltass, Esq., from the coast of Asia Minor.
opposite Rhodes.

Fitch, *del.*

ADULTERATION.—Mr. Maltass says that Liquid Storax is rarely pure, being adulterated by the admixture of sand and ashes.

COMMERCE.—Lieut. Campbell states that the quantity of Liquid Storax annually extracted, amounts to about 20,000 *okes* (500 cwt.) from the districts of Giova and Ullà; and 13,000 *okes* (325 cwt.) from those of Marmorizza and Isgengak.*

It is exported in casks to Constantinople, Smyrna, Syra and Alexandria. Some is also packed with a certain proportion of water in goat-skins and sent, either by boats or overland to Smyrna, where it is transferred to casks and shipped mostly to Trieste.

It appears from Mr. Maltass, that formerly the whole, both of the resin and the residual bark, was bought by the merchants of the island of Rhodes, but at what period and under what circumstances this occurred, I have not been able to learn.†

Though I have no pretensions to be an Oriental scholar, I may be allowed to offer a few words respecting some of the eastern names of *Liquid Storax* and the bark which remains after its extraction.‡

Liquid Storax is known to the Turks by the name قره کونلک یاغی *Kara ghyunluk yaghy*, i. e. *Black Frankincense Oil*.§ It is also called بخور یاغی *Bukhur yaghy*, i. e. *Incense Oil* and sometimes (according to Mr. Maltass) سغاله یاغی *Sighala yaghy*, i. e. *Sighala Oil* from the district between Melasso and Macri where much of it is collected.

The Greeks designate it σρόπαξ ὑγρὰ, but often use the Turkish name *Bukhur yaghy*.

In a *Report of the External Commerce of Bombay* to which my attention was directed by my friend Dr. Royle, the term *Rose Malloes* is applied to a drug enumerated under the category of *Imports by Sea into the Port of Bombay*.||

The recurrence of this strange name which Petiver's account of *Liquid Storax* had made familiar, struck me as very curious, and I wrote to Bombay for a sample of the drug so called. This was kindly procured for me at the Bombay Custom House by Dr. Carter, and proved to be our ordinary *Liquid Storax*. It is imported chiefly from the Red Sea, which it doubtless reaches from Alexandria, to which port I found it was shipped from Rhodes. Here then is the explanation of Petiver's statement of the drug being carried *southward* from Suez,—it being in fact, on its way to India.

* In English commerce, 40 *okes* are reckoned as equal to one hundredweight.

† Dr. Landerer's account appears to have reference to this period: and even his statement of the *cultivation* of the Storax plant (whatever plant is intended) has some support from the following passage in Duhamel's *Traité des Arbres* T. ij. p. 288.

"Au Levant on cultive aux environs de Stanchir [Cos], les arbres qui donnent le Storax, et on les multiplie par marcottes." Dr. Landerer's *βουχούρι*, it will also be observed, is traceable in the Turkish name *bukhur*.

‡ I will here acknowledge the assistance kindly afforded me by Dr. Greenhill, the translator of Rhazes, on the subject of Arabic names; and also that of J. W. Redhouse Esq. with regard to Turkish names.

§ *Olibanum* is called in Turkish کونلک *ghyunluk*.

|| The following is an extract from the Report referred to:—

| "Rose Malloes." | cwt. | qr. | lb. | value |
|---------------------|------|-----|-----|---------------|
| "From Aden | 5 | 0 | 0 | 186 rupees |
| "Arabian Gulf | 41 | 0 | 0 | 1574 " |
| "Persian Gulf | 12 | 0 | 0 | 480 " |
| Total..... | 58 | 0 | 0 | 2240 rupees." |

His term *Cotter Mija* is the Arabic قطر مية *Katr may'a*, مية may'a being one of the Avicennian terms for Storax, and قطر *katr* (literally a drop), a prefix indicating its liquid nature.*

The only other author with whom I am acquainted that alludes to *Rosa Mallas* is Garcia,† who, when describing the various sorts of Benzoin, mentions "*Roga-malha*," which he asserts is the name applied by the Chinese to *Liquid Storax*.

Whether it is the resin of the *Rasamāla* (*Liquidambar altingiana* Bl.) that is here intended, and whether the *Rosa Mallas* of Petiver and the *Rose Malloes* of the Bombay List are but corruptions of the same term applied to a different substance, are points which I shall not attempt to decide.

The residual bark after the extraction of the *Liquid Storax*, is known to pharmacologists as *Cortex Thymiamatis*, *Cortex Thuris*, *Thus Judæorum*, *Narcaphthum*, *Storax Bark* or *Red Storax*,‡ and is called in Turkish

قره کونلک پیراق *Kara ghyunluk yaprak* or more correctly قره کونلک پیراغي *Kara ghyunluk yapraghi*, literally *Black Frankincense Leaf*.

In modern Greek it is known by the simple name of στίραξ.

The name θυμίαμα (*Incense*) does not appear to have any special application to *Liquidambar Bark*.

Belon has asserted that this bark is called *Maurocapnos* and authors have quoted the name on his authority. I cannot but think this an error; *Μαυρο καπνός* signifies literally *Black Smoke*, and in modern Greek it is used by metonymy for *Black Tobacco*. It does not appear to be now applied to the *Liquidambar bark*.

The name *Νάσκαφθον* or *Νάρκαφθον* used by Dioscorides to designate a certain odoriferous bark from India,|| has been thought by many authors to have reference to the modern *Cortex Thymiamatis*. But if the latter were collected in the days of Dioscorides, that author, a native of Asia Minor, could scarcely have been so ignorant of the locality of its production, as to have regarded it as an *Indian drug*. Moreover, neither the names *Νάσκαφθον* nor *Νάρκαφθον* (nor *Λάκαφθον* used by Paulus Ægineta¶ perhaps for the same substance) are known in modern Greek. I confess therefore, I do not see evidence for identifying the Dioscoridean drug with the product of *Liquidambar*.

The conclusions to which this long investigation leads, may be thus briefly summed up.

1. That the original and classical Storax was produced by *Styrax officinale* Linn.

2. That always scarce and valuable, it has in modern times wholly disappeared from commerce.

* Lib. II. cap. 623. (ed. Venet. 1564).—It can scarcely be doubted, that in this chapter on "*Miha vel Meha*" which the translators have rendered *Storax*, Avicenna refers to the modern *Liquid Storax*. The passage is as follows :

"* * * Storax humida alia est, quæ extrahitur per se ipsam gumma : et alia est quæ extrahitur cum decoctione : per se autem extracta, est citrina, et quando antiquatur, declinat ad anreum colorem, et est [preciosa et grata] : sed quæ extrahitur ex cortice est nigra : et illud ideo quoniam extrahitur cum decoctione corticis illius arboris, et quod extrahitur, est storax humida : et quod remanet sicut fæx et vinacia, est sicca."

† *Aromatum et simplicium aliquot medicamentorum apud Indos nascentium Historia*. Antv 1574.

‡ Amygdaloid Storax is also sometimes called *Red Storax*.

§ "Je vei aussi descharger vn brigantin dessus la rive du port [de Rhodes], plein d'une drogue propre en medecine, appellée Storax rouge. Les Grecs la nomment maintenant *Maurocapno*. Et m'a lon dit qu'il croist en l'isle."—Belon, *Observations de plusieurs Singularitez &c.* (1554) liv. 2. chap. 14.

|| *Νάσκαφθον*, οὗ δὲ νάρκαφθον, καὶ τοῦτο ἐκ τῆς Ἰνδικῆς κομίζεται ἔστι δὲ φλοιῶδες, συκαμίον λεπίσμασιν ὅμοιον, θυμιάμενον διὰ τὴν εὐωδίαν, καὶ μιγνύμενον τοῖς σκευαστικοῖς θυμιάμασι, ὠφελοῦν καὶ μήτραν ἐστρωμένην ὑποθυμιασθέν. *Diosc. de Mat. Med.* ed. Sprengel, lib. I. c. 22

¶ Lib. 7. c. 22.

3. That the accounts of the collection of *Liquid Storax* given by Petiver and Landerer are in many important particulars grossly erroneous.
 4. That *Liquid Storax* is the produce of *Liquidambar orientale* Miller, and that it is collected in the south-west of Asia Minor.
 5. That the bark of *Liquidambar orientale* Miller, after *Liquid Storax* has been expressed from it, constitutes the *Cortex Thymiamatis* of Europe.
 6. That there is no evidence of the *Νάσσαφθον* of Dioscorides being the bark of *Liquidambar orientale*.
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In a future communication, I propose to offer some account of the manner of preparing the drug now found in the shops as *Styrax calamita*.
